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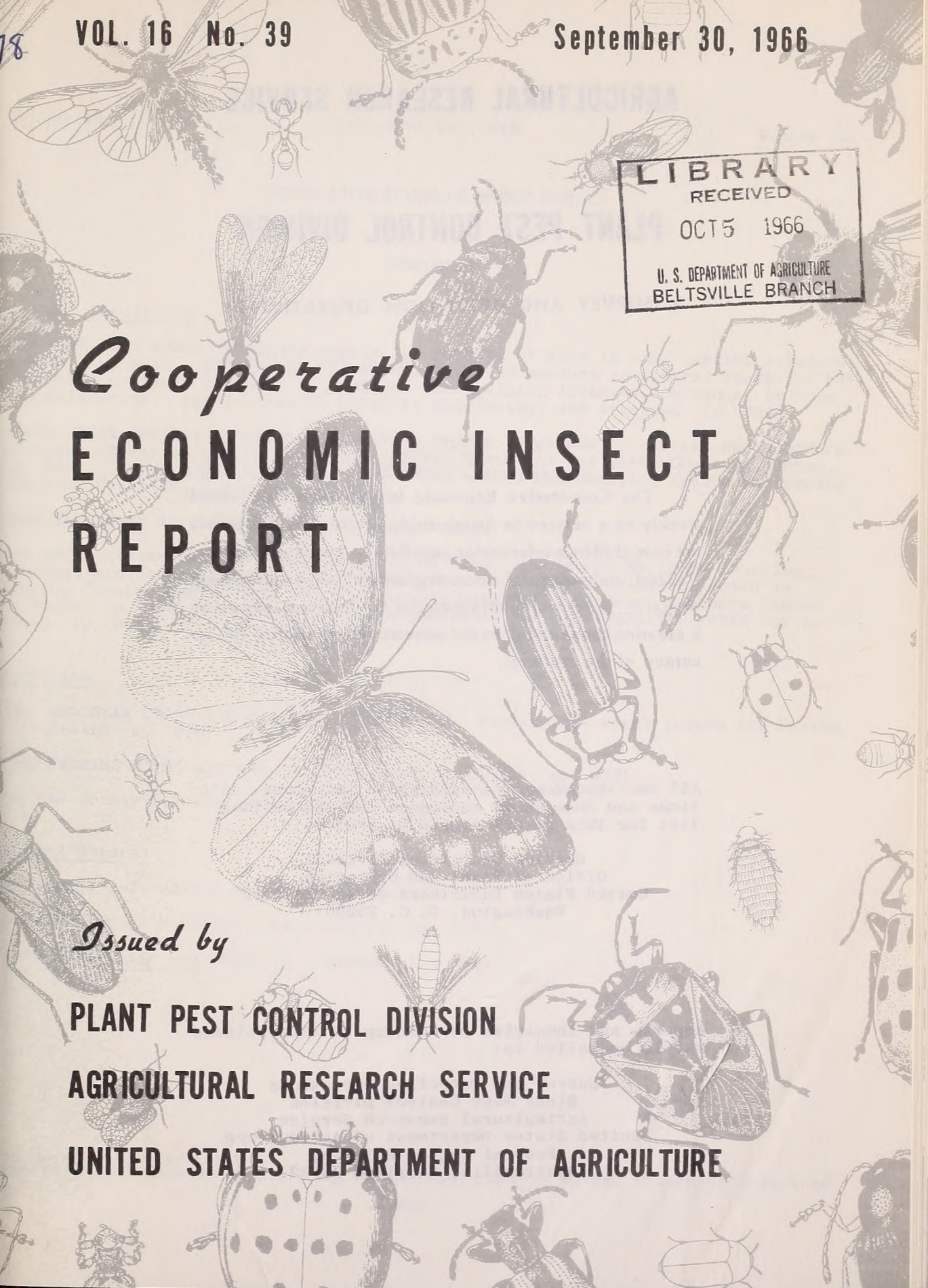
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Cooperative **ECONOMIC INSECT REPORT**

Issued by

PLANT PEST CONTROL DIVISION

AGRICULTURAL RESEARCH SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearinghouse and does not assume responsibility for accuracy of the material.

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COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

EUROPEAN CORN BORER infesting nearly 100 percent of corn in some eastern Nebraska fields. (p. 935). RED-NECKED PEANUTWORM heavy on peanuts in central Texas. (p. 937). BOLLWORMS continue economic in Alabama, Mississippi, Arkansas, Oklahoma, Arizona and California. Egg deposition heavy in Mississippi and Arkansas. (p. 938).

BLACK PECAN APHID increasing and causing damage to pecans in central and southern Alabama. Heavy on pecans in Houston, Hill, Erath and Val Verde Counties, Texas. (p. 940). Large populations of WHITE APPLE LEAFHOPPER damaging apples in Berrien and Kent Counties, Michigan. (p. 940).

HORN FLY heavy in Oklahoma and Texas. (p. 943).

New infestations of PINK BOLLWORM found in Yuma, Graham and Maricopa Counties, Arizona, and Coachella Valley in California. RANGE CATERPILLAR collected in Lincoln County, New Mexico; this new county record and farthest southern record in State. (p. 944). Treatment program completed for MEDITERRANEAN FRUIT FLY in Texas. (p. 945).

Detection

- EUROPEAN CRANE FLY reported from Blaine, Washington; first record for United States. (p. 946).

BERMUDAGRASS MITE reported for first time in Hawaii. (p. 948).

For new county records see page 946.

Special Reports

Background information of European Crane Fly. (p. 949).

Distribution of Northern Corn Rootworm. (p. 950).

Survey for Heliothis Moths in Arkansas. (p. 951).

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WEATHER OF THE WEEK ENDING SEPTEMBER 26

HIGHLIGHTS: (1) More heavy rains East. (2) Third cool week East; third warm week, Montana area.

TEMPERATURE: Bright sunny skies prevailed over most of the western half of the United States. Temperatures climbed to the 90's over parts of Montana on several days, and much of the Great Basin warmed to 90° or higher on Thursday. Boise and Lewiston, Idaho, each registered 99°, a new record for so late in the season. Cooler air moved into the Northwest during the weekend. Cool weather continued over the East for the third consecutive week. Maximum temperatures ranged from the 50's and 60's along the eastern half of the Canadian border to the 80's along the gulf coast. Temperatures plunged to the upper 20's early Monday morning in parts of Wisconsin and Michigan. Lansing, Michigan, set a new September record, registering 27°. Weather continued on page 939.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

SPOTTED ALFALFA APHID (*Therioaphis maculata*) - UTAH - Still severe in Delta, Sutherland and Hinckley areas of Millard County; alfalfa hay blackened. (Knowlton, Sept. 19). Light on alfalfa in Midvale area of Salt Lake County. (Knowlton). WYOMING - Continues very light, 2-5 per 10 sweeps on alfalfa in Laramie, Goshen and Platte Counties. Sexual forms present in Goshen County. (Marks). COLORADO - Decreased rapidly on alfalfa in Arkansas Valley; 0-1,000 per 100 sweeps. (Schweissing, Sept. 22). Populations low but well distributed on Western Slope, including Garfield County. (Bulla). NEBRASKA - Light in Custer County; however, heavy in one field near Anselmo, with over 70 aphids per sweep. Severe stunting and yellowing observed. (Manglitz). SOUTH DAKOTA - Low, 3-25 per 100 sweeps on alfalfa in north central and east central areas. Alates taken at Agar, Sully County; Firesteel, Dewey County; Mobridge, Corson County; and Wallace, Codington County. These new county records. (Jones).

CORN LEAF APHID (*Rhopalosiphum maidis*) - ALABAMA - Medium to heavy on grain sorghum in Baldwin County. (McQueen). INDIANA - Occasional colony present on late corn in northern third of State. (Huber). SOUTH DAKOTA - Common on green corn ears in north central and east central areas. Up to several hundred per ear. Lady beetle larvae, 1-2 per ear, feeding on aphids. (Jones).

CORN EARWORM (*Heliothis zea*) - MARYLAND - Moths decreased in blacklight traps at Snow Hill, Worcester County. Soybean pod infestations light on lower Eastern Shore. (U. Md., Ent. Dept.). SOUTH CAROLINA - Still causing pod damage in some counties. Increased in Greenville, Sumter, Lee, Marlboro, Orangeburg, Fairfield and Allendale Counties. (Thomas, Kissam, Sept. 20). FLORIDA - Heavy on sorghum at Live Oak, Suwannee County. Det. by D. H. Habeck. (Crews). TENNESSEE - Heavy on soybeans south and west of Jackson, Madison County. May infest late soybeans. (Johnson, Sept. 19). INDIANA - Adult trap catches heaviest this season in following counties: Posey 198; Harrison 421; Jackson 529. (Huber). OKLAHOMA - Ranged 2-9 (average 6) per 10 sweeps in alfalfa in Payne County. Moderate in sorghum in Cleveland County. (Okla. Coop. Sur.). COLORADO - Egg counts continue zero on tomatoes in Arkansas Valley, moth flights low. Harvest about complete. (Schweissing, Sept. 22).

ARMYWORM (*Pseudaletia unipuncta*) - TEXAS - Heavy in several pastures and lawns near Athens, Henderson County. Buildup expected to continue until frost. (Hoffman).

TOMATO HORNWORM (*Manduca quinquemaculata*) - WISCONSIN - Larvae continue low on late tobacco in Dane County. (Wis. Ins. Sur.).

CORN, SORGHUM, SUGARCANE

EUROPEAN CORN BORER (*Ostrinia nubilalis*) - OHIO - Severe on sweet corn and Indian corn in central and southeastern areas; up to 100 percent stalks infested in Washington County. Highest field corn infestation, 30 percent in Pickaway County. (Rose, Sept. 16). MISSOURI - Average percent infestation and average number of borers per 100 plants, respectively by county: Pemiscot 48.0, 128.0; New Madrid 74.4, 245.6; Mississippi 64.0, 133.6; Scott 53.6, 198.4. (Munson). NEBRASKA - Infestations heavy in late corn. Some fields nearly 100 percent infested in eastern section; harvest losses will be significant. (Roselle).

SOUTHWESTERN CORN BORER (*Zeadiatraea grandiosella*) - MISSOURI - Average percent girdled stalks by county: Pemiscot 25.6, New Madrid 36.0, Mississippi 34.4, Scott 13.6. Collected for first time in Bollinger County September 16. (Munson).

CORN ROOTWORMS (*Diabrotica* spp.) - WISCONSIN - *D. longicornis* adults still present in late corn and alfalfa in reduced numbers. (Wis. Ins. Sur.). NEBRASKA - *D. virgifera* adults decreasing in eastern area. Most females appear gravid. (Roselle).

FIELD CRICKETS (*Gryllus* spp.) - INDIANA - Adults extremely abundant in corn, soybeans, and roadside areas throughout northern half of State. Up to 20 per square foot in some areas. (Chandler, Huber).

SPIDER MITES (*Tetranychus* spp.) - UTAH - Severely discolored corn foliage in Brigham City and Tremonton area of Box Elder County. (Knowlton, Sept. 19). Damaging corn throughout Sevier County. (Knowlton, Rickenback).

SMALL GRAINS

GARDEN WEBWORM (*Loxostege similalis*) - TEXAS - Heavy in field of young wheat near Sunray, Sherman County; 50 of 320 acres destroyed. (Cross).

TURF, PASTURES, RANGELAND

FALL ARMYWORM (*Spodoptera frugiperda*) - TEXAS - Buildup continues in eastern portion of State; moderate to heavy in Kaufman, Henderson, and Gillespie Counties on pastures, lawns, and small grains. Buildup expected to continue until frost. (Hoffman, Roberts).

WHITE-LINED SPHINX (*Celerio lineata*) - COLORADO - Larvae abundant along highways, ditches and field margins in southeastern area. (Hantsbarger, Sept. 15).

GREEN JUNE BEETLE (*Cotinis nitida*) - OKLAHOMA - Larvae heavy and damaging turf in small areas in Tulsa County. (Okla. Coop. Sur.).

GREENBUG (*Schizaphis graminum*) - TEXAS - Scarce on western wheatgrass in some panhandle counties during summer as follows: Armstrong in June, Swisher in July, Ochiltree in August. (Daniels).

FORAGE LEGUMES

ALFALFA CATERPILLAR (*Colias eurytheme*) - SOUTH DAKOTA - Up to 65 larvae per 100 sweeps on alfalfa in north central and east central areas. (Jones). COLORADO - Found in alfalfa in all areas of Arkansas Valley; 0-1,000 per 100 sweeps. Highest in some new stands. (Schweissing, Sept. 22). UTAH - Stripping fields of alfalfa in Saint George and Washington areas, Washington County. (Knowlton). ARIZONA - Larvae increasing and damaging alfalfa in Kansas Settlement area of Cochise County and Buckeye and Chandler areas of Maricopa County. (Ariz. Coop. Sur.). NEW MEXICO - Larvae 8-10 per 25 sweeps in Chaves County alfalfa. Adults numerous in some fields. (Mathews).

GREEN CLOVERWORM (*Plathypena scabra*) - OKLAHOMA - Averaged 7 per 10 sweeps on alfalfa in Cotton County. Ranged 1-10 (average 4) per 10 sweeps in Payne County. (Okla. Coop. Sur.).

GARDEN WEBWORM (*Loxostege similalis*) - ARIZONA - Larvae 45 per 100 sweeps on alfalfa in Roll and Mohawk areas, Yuma County. (Ariz. Coop. Sur.).

PEA APHID (*Acyrtosiphon pisum*) - OHIO - Increased in alfalfa after long period of scarcity; 24-190 per sweep. (Rose). INDIANA - Ranged 8-26 per sweep on alfalfa in northern third of State. (Huber). SOUTH DAKOTA - Ranged 200-500 per 100 sweeps on alfalfa in north central and east central counties. (Jones). WYOMING - Increased slightly on alfalfa in Laramie, Goshen, Platte and Converse Counties. Adults and nymphs 225-250 per 10 sweeps. (Marks). COLORADO - Decreased in alfalfa in Arkansas Valley; 0-900 per 100 sweeps. (Schweissing, Sept. 22). NEW MEXICO - Light to moderate in some alfalfa in Roswell area, Chaves County. (Mathews). WASHINGTON - One per 15 sweeps at Prosser, Benton County; one per 5 sweeps at Pasco, Franklin County; one per 50 sweeps at Walla Walla, Walla Walla County. All alates on forage alfalfa. (Halfhill).

LYGUS BUGS (*Lygus* spp.) - WASHINGTON - Adults and nymphs 1 per 3 sweeps on alfalfa at Prosser, Pasco, and Walla Walla. (Halfhill). OHIO - *L. lineolaris* continues common plant bug on alfalfa; up to 3 per sweep. (Rose).

THREE-CORNERED ALFALFA HOPPER (*Spissistilus festinus*) - NEW MEXICO - Adults 4-6 per 25 sweeps in alfalfa near Roswell, Chaves County. (Mathews). ARIZONA - Heavy populations appearing on alfalfa in Cochise area, Cochise County; lighter in other areas. (Ariz. Coop. Sur.).

SOYBEANS

GREEN CLOVERWORM (*Plathypena scabra*) - SOUTH CAROLINA - This species and loopers building up on soybeans in Colleton, Lee, Darlington, Marlboro, and Allendale Counties. (Thomas, Kissam, Sept. 20). TENNESSEE - Extremely low on soybeans; probably between generations. Several appear to have been killed by virus. (Johnson, Sept. 19).

CABBAGE LOOPER (*Trichoplusia ni*) - ALABAMA - Heavy, widespread populations feeding on soybean foliage throughout Geneva County. (Smith).

FALL ARMYWORM (*Spodoptera frugiperda*) - TEXAS - Damaging numbers observed on soybeans in extreme northeastern portion of State. Buildup expected to continue until frost. (Hoffman, Roberts).

BEAN LEAF ROLLER (*Urbanus proteus*) - FLORIDA - Moderate on 60-acre field of soybeans at Brooksville, Hernando County. (Strayer).

VELVETBEAN CATERPILLAR (*Anticarsia gemmatilis*) - ALABAMA - Damaged 150 acres of soybeans in Geneva County; controls required. (Reynolds).

A NOCTUID MOTH (*Pseudoplusia includens*) - FLORIDA - Adults and larvae taken on soybeans at Gainesville, Alachua County. Presumably this species, heavy on soybeans north of Gainesville; controls applied. (Mead, Andrews). This and *Anticarsia gemmatilis* abundant on soybeans in western section, but now under natural control by fungus, probably *Spicaria rileyi*. (Strayer).

STINK BUGS - TENNESSEE - Increasing on soybeans. (Johnson, Sept. 19). NORTH CAROLINA - *Acrosternum hilare*, *Euschistus servus* and other species continue to increase on soybeans in Johnston, Wayne, Beaufort and Washington Counties. Averaged 8.25 per 25 feet of row in 12 fields compared to 6.3 last week and 3.8 two weeks ago. (Mount). SOUTH CAROLINA - Activity of unspecified species increased on soybeans in Allendale, Colleton, Greenville, Lee, Darlington, Marlboro, Williamsburg, and Bamberg Counties. (Thomas, Kissam, Sept. 20). FLORIDA - *Nezara viridula* and *E. servus* moderate to heavy in 120 acres of soybeans at Brooksville, Hernando County. (Strayer). MISSISSIPPI - *A. hilare* remains at high level in scattered soybean fields in south and central delta area. (Dinkins).

PEANUTS

A BURROWING STINK BUG (*Pangaeus* sp.) - ALABAMA - Adults and nymphs continue medium and widespread in peanut fields in Geneva County. (Smith).

NEGRO BUG (*Corimelaena pulicaria*) - FLORIDA - Damage resulted in 3 percent dockage to value of harvested peanuts in Holmes County. (Strayer, Sept. 12).

RED-NECKED PEANUTWORM (*Stegasta bosqueella*) - TEXAS - Numbers high in every peanut field checked in Hill, Erath, Comanche and Houston Counties. (Parker et al.).

COTTON

BOLL WEEVIL (Anthonomus grandis) - SOUTH CAROLINA - Destroying young fruit in unprotected fields. (Cott. Ltr., Sept. 19). ALABAMA - Continues heavy in many northern counties; controls still required. (Pitts et al.). MISSISSIPPI - Live weevils found in white blooms and young squares. Some movement to soft bolls; all punctures and feeding in concentrated areas in Tallahatchie, Leflore, Holmes, Washington, and Sharkey Counties. (Dinkins, Sept. 23). ARKANSAS - Heavier in extreme northeast area than in any year since 1957; controls continue. (Boyer). OKLAHOMA - Percent punctured squares averaged 70 in untreated cotton in Tillman County, 15 in treated cotton in Cotton County. Heavy in Jackson County, moderate in Cleveland County. (Okla. Coop. Sur.).

For Boll Weevil in Western States, see page 944.

BOLLWORMS (Heliothis spp.) - SOUTH CAROLINA - Damage to maturing bolls decreased slightly due to increased attraction to soybeans. (Cott. Ltr., Sept. 19). ALABAMA - Continue serious in cotton in some northern counties. (Robinson et al.). MISSISSIPPI - Small larvae of H. zea and H. virescens found in terminals of green cotton; 5 per 100 terminals. Eggs 30-40 per 100 terminals in green cotton. (Dinkins, Sept. 23). ARKANSAS - Large numbers of moths present in most fields. Egg deposition heavy, eggs appear fertile; however, few larvae developing. Of Heliothis larvae collected in Jefferson County in August, 3.26 percent H. virescens. (Boyer). OKLAHOMA - Averaged 7 per 100 terminals in cotton in Cotton County. (Okla. Coop. Sur.). ARIZONA - H. zea heavy throughout Maricopa, Pinal and Pima Counties; lighter in other counties. (Ariz. Coop. Sur.). CALIFORNIA - Continue economic problem in some Imperial County cotton. (Campbell, Sept. 16).

CABBAGE LOOPER (Trichoplusia ni) - ARKANSAS - Virus disease greatly reduced larval numbers; eggs very numerous past two weeks but larvae low. (Boyer).

COTTON LEAF PERFORATOR (Bucculatrix thurberiella) - ARIZONA - Leaf damage heavy in Yuma, Pinal and Maricopa Counties. (Ariz. Coop. Sur.). CALIFORNIA - Activity increased in Imperial County during August; presently decreasing. (Campbell, Sept. 16).

SALT-MARSH CATERPILLAR (Estigmene acrea) - ARIZONA - Light to moderate in most areas of Pima, Pinal and Maricopa Counties. (Ariz. Coop. Sur.).

STINK BUGS - CALIFORNIA - Populations on cotton declined since mid-August in Imperial County. (Campbell, Sept. 16).

SPIDER MITES (Tetranychus spp.) - ALABAMA - Considerable increase in damage reported in several northern counties, especially De Kalb County. (Robinson, Burton).

POTATOES, TOMATOES, PEPPERS

POTATO TUBERWORM (Phthorimaea operculella) - CALIFORNIA - Heavy on potatoes in Escondido, San Diego County. (Cal. Coop. Rpt.). UTAH - Light on potatoes in Iron and Washington Counties; 1 larva per 100 pounds. (Knowlton, Hall, Sjoblom).

BEANS AND PEAS

MEXICAN BEAN BEETLE (Epilachna varivestis) - WYOMING - Ranged 10-50 per 10 sweeps in Goshen County field beans. Most beans cut. (Marks).

AN APHID (Smynturoides betae) - NEW YORK - Seriously damaged one acre of beans in 8-acre field in Yates County September 19, 1965. Det. by M. D. Leonard. (Leonard).

COLE CROPS

CABBAGE LOOPER (Trichoplusia ni) - TEXAS - Moderate to heavy on cabbage in Pecos County. Damage moderate to collard greens in several gardens in Groveton, Trinity County. (Lang, Neeb). NEW MEXICO - This species and imported cabbageworm light to heavy, damaging cabbage and cauliflower in Albuquerque area, Bernalillo County, and in Los Lunas area, Valencia County. (Heninger). OKLAHOMA - This and southern cabbageworm moderate on turnip foliage in Payne County. (Okla. Coop. Sur.).

YELLOW-STRIPED ARMYWORM (Prodenia ornithogalli) - OKLAHOMA - Heavy and damaging turnip foliage in Payne County. (Okla. Coop. Sur.).

HARLEQUIN BUG (Murgantia histrionica) - WYOMING - Adults and nymphs caused local heavy damage to leaves of radish and cabbage at Wheatland, Platte County. (Robb, Marks, Aug. 12). Other records include Laramie September 1 and Pine Bluffs September 9, 1960, and Laramie August 21, 1966. (Fronk).

FIELD CRICKETS (Gryllus spp.) - ARIZONA - Controls necessary on young lettuce in Yuma Valley. (Ariz. Coop. Sur.).

CABBAGE MAGGOT (Hylemya brassicae) - WISCONSIN - Serious on cole crops in Ashland County. (Wis. Ins. Sur.).

CUCURBITS

SQUASH BUG (Anasa tristis) - NEW MEXICO - Light to moderate on squash causing serious problem in truck gardens and home gardens in Albuquerque area, Bernalillo County. (Heninger).

GENERAL VEGETABLES

CABBAGE LOOPER (Trichoplusia ni) - MICHIGAN - Total of 38 adults taken in black-light traps in Newaygo, Macomb, Lenawee and Gratiot Counties; heaviest counts of season. Collections from other counties insignificant. (Newman). COLORADO - Damaging lettuce in Otero County. Infestation 0-65 (average 27) percent. (Schweissing).

Weather continued from page 934.

PRECIPITATION: Heavy rains fell over the Southeast on Monday and over the Middle Atlantic States and Northeast on Tuesday and Wednesday. More than 5.5 inches fell at Central Park, New York City, on Wednesday; the heaviest rain at that location in 63 years. The rains drenched much of the Northeast and ended the agricultural drought in some areas. A cold front, stretching from the central Rocky Mountains eastward to the Atlantic Ocean, produced light rains from Wyoming to New York on Saturday and Sunday. Precipitation was of little consequence over other parts of the Nation. Light snow fell in northern New England late in the week, accumulating up to 2 inches on the higher mountains in New Hampshire. (Summary supplied by Environmental Data Service, ESSA).

DECIDUOUS FRUITS AND NUTS

CODLING MOTH (Carpocapsa pomonella) - NEW MEXICO - Heavily damaged apple and pear orchards in Bernalillo, Sandoval and Valencia Counties where sprays improperly timed or neglected. (Heninger).

PEACH TWIG BORER (Anarsia lineatella) - NEW MEXICO - Severely damaged terminals of young peach trees at Corrales, Sandoval County. (Heninger)

APPLE-AND-THORN SKELETONIZER (Anthophila pariana) - CALIFORNIA - Larvae medium on apple trees in Fortuna, Humboldt County. (Cal. Coop. Rpt.).

ORCHARD MITES - MICHIGAN - Panonychus ulmi adults and nymphs still abundant in many southwest area apple and plum orchards. Winter eggs common on twigs and on calyx of apples. (Wooley). Adults and nymphs of undetermined eriophyid mites common on overwintering buds of Montmorency cherries in some Grand Traverse County orchards; may be associated with dead branches. (Wooley, McManus, Kessner). OHIO - Numerous overwintering eggs of P. ulmi observed on apple branches in orchard in Licking County; expected over entire State. (Rose). NEW MEXICO - Tetranychus mcdanieli causing damage to apple foliage in Bernalillo and Lincoln Counties. (N. M. Coop. Rpt.). CALIFORNIA - Aculus cornutus medium on nectarine trees in Sacramento, Sacramento County. (Cal. Coop. Rpt.).

WHITE APPLE LEAFHOPPER (Typhlocyba pomaria) - MICHIGAN - Feeding injury by large populations of adults and nymphs caused leaf chlorosis on apples in Berrien and Kent County orchards. Honeydew and sooty fungus discolored fruit and foliage. (Wooley, Carpenter, Klackle).

LYGUS BUGS (Lygus spp.) - WASHINGTON - Adults damaged ripe peaches, reducing grade from number 1 to number 2 in orchard in Clark County. (Shanks, Sept. 6).

BLACK PECAN APHID (Myzocallis caryaefoliae) - TEXAS - Heavy on many pecan trees in Houston, Hill, Erath and Val Verde Counties. Unusually heavy throughout pecan-growing areas of State. (Horne, Parker). ALABAMA - This and yellow species increasing and damaging pecans in central and southern areas. Shedding of leaves continues in Barbour, Covington, Bulter, Mobile, and other counties. (Walton et al.).

AN APHID (Monellia caryae) - MARYLAND - Light on black walnut at La Vale, Allegany County. (U. Md., Ent. Dept.).

FALL WEBWORM (Hyphantria cunea) - ARKANSAS - Heavy on pecans in extreme southeast area. (Boyer).

WALNUT CATERPILLAR (Datana integerrima) - OKLAHOMA - Heavy and defoliating pecan trees in Payne County. (Okla. Coop. Sur.). TEXAS - Light to moderate on pecans in Jefferson and Eastland Counties. (Weaver, Thomas).

PECAN WEEVIL (Curculio caryae) - OKLAHOMA - Larvae emerging from nuts in Payne County; moderate in Mayes County. (Okla. Coop. Sur.). TEXAS - First adults noted week ending September 16 near Valley View, Cooke County. (Texas Coop. Rpt.).

WALNUT HUSK FLY (Rhagoletis completa) - CALIFORNIA - Larvae heavy in walnuts in Petaluma, Sonoma County; populations variable in other walnut-growing areas. (Cal. Coop. Rpt.).

CITRUS

A LEAF ROLLER MOTH (Platynota stultana) - ARIZONA - Continues to damage citrus in nurseries in Yuma County. Consistent controls necessary to protect young citrus. (Ariz. Coop. Sur.).

FALSE SPIDER MITES (Brevipalpus spp.) - ARIZONA - B. lewisi increasing on Yuma Mesa citrus, Yuma County; controls applied. (Ariz. Coop. Sur.). FLORIDA - B. phoenicis moderate on 450 orange trees in Hillsborough County. (Simmons, Sept. 12).

AN ARMORED SCALE (Unaspis citri) - FLORIDA - Severe on 25 percent of 7,425 orange trees in nursery in Ferndale, Lake County. (Fatic).

OTHER TROP. & SUBTROP. FRUITS

A LEAF ROLLER MOTH (Platynota stultana) - CALIFORNIA - Larvae damaging avocado tree nursery stock in Bonsall, San Diego County. Larvae feeding under grafting tape on budded trees. (Cal. Coop. Rpt.).

SMALL FRUITS

GRAPE LEAF SKELETONIZER (Harrisina americana) - FLORIDA - Infesting grape in Gainesville, Alachua County. (Mead, Sept. 11). Troublesome on grape in Santa Rosa County. (Strayer).

LESSER CORNSTALK BORER (Elasmopalpus lignosellus) - CALIFORNIA - Infesting strawberry plants in Highlands, San Bernardino County. (Cal. Coop. Rpt.).

GREENHOUSE WHITEFLY (Trialeurodes vaporariorum) - CALIFORNIA - Heavy on wild blackberry thickets in Walnut Grove, Sacramento County. (Cal. Coop. Rpt.).

ORNAMENTALS

SALT-MARSH CATERPILLAR (Estigmene acrea) - FLORIDA - Moderate on 150 palms (Phoenix roebelenii) inspected in nursery in Davie, Broward County. Larvae cutting new growth out of tops of palms. (Shirah, Sept. 16).

GENISTA CATERPILLAR (Tholeria reversalis) - CALIFORNIA - Larvae heavy on genista plants in Ventura, Ventura County. (Cal. Coop. Rpt.).

A SWALLOWTAIL BUTTERFLY (Papilio philenor) - ARIZONA - Larvae damaging flowers and lawns in Tucson area, Pima County. (Ariz. Coop. Sur.).

SCALE INSECTS - CALIFORNIA - Saissetia coffeae medium on fern nursery stock in South San Francisco, San Mateo County. (Cal. Coop. Rpt.). NEW MEXICO - Unaspis euonymi killing established plants in many areas of Albuquerque. Residents removing infested plants rather than continue unsuccessful controls. (Heninger). FLORIDA - Ceroplastes ceriferus moderate to severe on podocarpus at nursery in Fellowship, Marion County. (Holder, Sept. 15).

MEXICAN MEALYBUG (Phenacoccus gossypii) - CALIFORNIA - Heavy on Lantana camara nursery stock in nursery at Chula Vista, San Diego County. (Cal. Coop. Rpt.).

A CONIFER APHID (Cinara tujaefilina) - NEVADA - Heavy on arborvitae with much honeydew present in Reno, Sparks area, Washoe County. (Hilbig).

A WEEVIL (Brachyrhinus cribricollis) - ARIZONA - Damaging roots of privet hedges in Tucson, Pima County. (Ariz. Coop. Sur.).

BOXELDER BUG (Leptocoris trivittatus) - TEXAS - Moderate to heavy on many shade trees and ornamental plants in southern portion of Hood County. (Hillman).

FOREST AND SHADE TREES

ELM LEAF BEETLE (Pyrrhalta luteola) - UTAH - Defoliated about 25 percent of elm trees at Kanab, Kane County. (Knowlton, Lindsay). NEW MEXICO - Serious on elm trees in Albuquerque area Bernalillo County. Damage more common on Chinese elm than other elms. Some homeowners removing Chinese elm trees because of this pest. (Heninger). TEXAS - Light on most Chinese elms in Upton County. (Day).

SMALLER EUROPEAN ELM BARK BEETLE (Scolytus multistriatus) - MICHIGAN - Second-brood adults active in Lower Peninsula, causing twig drop. (Wallner). CALIFORNIA - Adults medium on evergreen elm in Riverside, Riverside County. (Cal. Coop. Rpt.).

LOCUST BORER (Megacyllene robiniae) - OHIO - First adults of season observed September 8 on goldenrod in black locust plots in Delaware County. (Wollerman).

CATALPA SPHINX (Ceratomia catalpae) - OHIO - Severely defoliating catalpa trees in areas of Franklin and Delaware Counties; widespread defoliation observed in several north central counties. (Rose, Galford).

PAINTED MAPLE APHID (Drepanaphis acerifoliae) - NEVADA - Light on maple in nurseries in Reno, Sparks area; light to medium and increasing in southern Washoe County. (Bechtel, Hilbig).

CICADAS (Tibicen spp.) - ALABAMA - Extremely heavy adult emergence noted in Mobile, Baldwin, and other coastal counties. (Turner et al.).

PIGEON TREMEX (Tremex columba) - MICHIGAN - Ovipositing females active on diseased and weakened elms in Mason, Kent, Wayne and Monroe Counties. (Wallner).

LARCH SAWFLY (Pristiphora erichsonii) - NEW JERSEY - Oviposition injury noted on Japanese larch (Larix leptolepis) on Rutgers University campus at New Brunswick. Defoliation very light. (Drooz, Aug. 30).

SPRUCE GALL APHIDS (Adelges spp.) - RHODE ISLAND - A. cooleyi and A. abietis appear more evident over entire State than in recent years. (Veilleux, Mathewson).

A FLATHEADED BORER (Chrysobothris sp.) - MICHIGAN - Larvae injured red pine and jack pine stands in Oscoda, Kalkaska, Crawford, Grand Traverse and Wexford Counties. Infestations light, not more than 5 percent of trees attacked in 2 years. (Wilson, Flink).

MAN AND ANIMALS

MOSQUITOES - FLORIDA - Aedes aegypti heavy on 10-15 percent of properties inspected in Gainesville, Alachua County. Eradication program underway in area. (Fla. Coop. Sur.). LOUISIANA - Larval collections in Jefferson Parish contained A. triseriatus, Culex pipiens quinquefasciatus, C. salinarius, Psorophora ciliata, P. confinnis, A. sollicitans, A. taeniorhynchus, and P. confinnis increased throughout Parish. Mansonia perturbans population decreased sharply on west bank of Mississippi River. (Stokes). MINNESOTA - A. vexans continues dominant in light traps, larval collections and evening bite collections. In 1,059 larval collections, 680 were A. vexans, 184 C. restuans, 160 C. pipiens, 159 C. territans, 42 C. salinarius and 85 Culiseta inornata. (Minn. Ins. Rpt.). UTAH - Mosquitoes declined in Rich County areas. Still annoying in Cache Valley, Cache County. (Roberts, Knowlton). Population buildups occurred following recent flooding in Box Elder and Salt Lake Counties. (Knowlton, Sept. 19).

FACE FLY (Musca autumnalis) - UTAH - Annoying horses and cattle in Tremonton, Willard area of Box Elder County and Hyrum, Lewiston area of Cache County. (Knowlton, Sept. 19). Annoying horses in Midvale area of Salt Lake County; this new county record. (Knowlton, Sept. 23). WISCONSIN - Annoying Richland County cattle. (Wis. Ins. Sur.).

HOUSE FLY (Musca domestica) - WISCONSIN - Causing concern by seeking hibernation quarters in houses. (Wis. Ins. Sur.). ARKANSAS - Infestations continue heavy, especially in poultry-producing areas. (Roberts). OKLAHOMA - Ranged 15-20 per Scudder grid in untreated barns in Payne County. Continues to enter homes in many areas. (Okla. Coop. Sur.). UTAH - Troublesome about many homes and farms in Cache, Box Elder, Weber, Salt Lake, and Kane Counties. (Knowlton, Sept. 19).

HORN FLY (Haematobia irritans) - TEXAS - Heavy on cattle in Reagan, Crockett, Glasscock, and Van Zandt Counties. Populations exceptionally heavy due to unusually wet, late summer. (Neeb, Parker). OKLAHOMA - Ranged 750-1,000 per head on steers in Payne County. Moderate on cattle in Mayes County. (Okla. Coop. Sur.). WYOMING - Continues annoying cattle in Laramie, Goshen and Platte Counties; 75-100 per side. (Marks). UTAH - Still troublesome but numbers decreasing in central and northern areas. (Knowlton, Sept. 19).

SCREW-WORM (Cochliomyia hominivorax) - Total of 72 cases reported in U. S. September 18-24 as follows: TEXAS - 1 each in Hudspeth, Culberson, Crockett, Schleicher, Sutton, Real, Kendall, Hays, Medina, Frio, Webb, Duval, Hidalgo; Jeff Davis 2, Presidio 14, Brewster 4, Pecos 2, Terrell 3, Val Verde 3, Kinney 2, Bandera 3, Jim Hogg 2. NEW MEXICO - Eddy 1, Luna 3. ARIZONA - Graham 1, Cochise 4, Yavapai 3, Yuma 2, Mohave 4. CALIFORNIA - Riverside 1, San Diego 5. Total of 359 cases reported in portion of Barrier Zone in Republic of Mexico as follows: Territorio sur de Baja California 20, Sonora 195, Chihuahua 115, Coahuila 5, Nuevo Leon 8, Tamaulipas 16. Total of 464 reported from Mexico south of Barrier Zone. Barrier Zone is area where eradication operations underway to prevent establishment of self-sustaining populations in U. S. Sterile screw-worm flies released: Texas 10,076,250, New Mexico 5,672,000, Arizona 21,684,000, California 600,000, Mexico 88,492,000. (Anim. Health Div.).

HORSE BOT FLY (Gasterophilus intestinalis) - OKLAHOMA - Adults heavy and annoying horses in Payne County. (Okla. Coop. Sur.).

LONE STAR TICK (Amblyomma americanum) - OKLAHOMA - Larvae continue numerous, annoying cattle and people in southeast area. Nymphs and adults scarce. (Okla. Coop. Sur.).

TROPICAL RAT MITE (Ornithonyssus bacoti) - OKLAHOMA - Causing annoyance in several homes in Oklahoma County. (Okla. Coop. Sur.).

A BROWN SPIDER (Loxosceles reclusus) - OKLAHOMA - Increased activity reported in many areas of State. (Okla. Coop. Sur., Sept. 17).

HOUSEHOLDS AND STRUCTURES

A FALSE POWDER-POST BEETLE (Polycanon stouti) - CALIFORNIA - Larvae and pupae heavy in oak veneer in plywood company in Los Angeles, Los Angeles County. Probably this species in Japanese ash hardwood cabinets at residence in Newberry Park, Ventura County, and light in furniture at residence in Rohnert Park, Sonoma County. (Cal. Coop. Rpt.).

STORED PRODUCTS

WEBBING CLOTHES MOTH (Tineola bisselliella) - TEXAS - Moderate to heavy in many wool and mohair warehouses in western sheep and goat raising area. Larvae feeding inside stored bags of wool and mohair. (Gray).

CIGARETTE BEETLE (Lasioderma serricorne) - FLORIDA - Infesting stored food products in warehouse in Tampa, Hillsborough County. (Clay).

BEAN WEEVIL (Acanthoscelides obtectus) - CALIFORNIA - Medium in stored beans in Placerville, El Dorado County. (Cal. Coop. Rpt.).

BENEFICIAL INSECTS

A PUNCTURE-VINE SEED WEEVIL (Microtharus lareynii) - NEW MEXICO - Conditions ideal for growth of puncture-vine and development of weevil. High population of grubs in maturing seeds in Las Cruces area. (N. M. Coop. Rpt.).

A BRACONID (Apanteles sp.) - MISSOURI - Parasitizing 85 percent of webworms (Loxostege spp.) in alfalfa field in northwest area. Det. by B. Puttler. (Munson).

A SCOLIID WASP (Scolia dubia) - OKLAHOMA - This white grub parasite common in eastern areas for past 3 weeks, commonly seen flying over lawns. (Okla. Coop. Sur.).

Beneficial Insects in Cotton - CALIFORNIA - Lacewings, big-eyed bugs, spiders and assassin bugs dominant in Imperial County; Orius spp. and Collops spp. light. Spiders most abundant. (Campbell, Sept. 16).

FEDERAL & STATE PLANT PROTECTION PROGRAMS

GRASSHOPPERS - MONTANA - Adults moderate to heavy in south central, north central and southeastern counties. Melanoplus sanguinipes dominant. Ranged 15-20 per square yard in coulees and draws on Blackfoot Indian Reservation. (PPC West. Reg., Aug. Rpt.). SOUTH DAKOTA - Still active throughout State. In area east of Timber Lake, Corson County, counts per square yard 20-25 in borders of alfalfa 10-15 within fields; 8-10 in adjoining corn. Primarily Melanoplus femurrubrum, M. bivittatus and M. differentialis. (Jones). NEW MEXICO - Grasshoppers causing minor damage to alfalfa in Albuquerque area, Bernalillo County; 4-10 per 25 sweeps, much heavier along roads and ditch banks. (Heninger).

PINK BOLLWORM (Pectinophora gossypiella) - ARIZONA - Light to moderate in 12 new areas in Yuma County. Also found in Maricopa, Stanfield, Coolidge, Sacaton, Florence and Casa Grande areas, Pinal County. New infestations found in Graham and Maricopa Counties. (Ariz. Coop. Sur.). CALIFORNIA - Situation continues to get worse. Moths trapped in lower Coachella Valley, Riverside County this period for first time. Treatments scheduled to start in Imperial Valley first of October. Detection this season 3,343 moths, 444 larvae, 1 pupa as follows: Imperial County - Bard Valley 469 adults, 44 larvae; Imperial Valley 841 adults, 60 larvae, no pupae. Riverside County - Palo Verde Valley 2,007 adults, 339 larvae; Coachella Valley 4 moths. San Bernardino County - Needles 22 months, 1 larva. (Cal. Coop. Rpt.).

RANGE CATERPILLAR (Hemileuca oliviae) - NEW MEXICO - Larvae collected September 12 near Encinosa, Lincoln County; new county record and most southern record in State; almost 200 miles from known infestations in Colfax and Union Counties where control previously conducted. Infestation apparently light. (N. M. Coop. Rpt.).

WESTERN GRAPE LEAF SKELETONIZER (Harrisina brillians) - CALIFORNIA - Locally heavy on grapevines in Carmichael, Sacramento County. Eradication treatment has kept up with survey and detection in this infestation. (Cal. Coop. Rpt.).

JAPANESE BEETLE (Popillia japonica) - MICHIGAN - Single beetle, only find of season in area, taken in trap at Grand Rapids, Kent County. (Moore).

WHITE-FRINGED BEETLES (Graphognathus spp.) - ARKANSAS - Collected in a cemetery at Brinkley, Monroe County, week ending September 9, this new county record. New infested areas found in Crittenden, St. Francis and Craighead Counties. (Frazier).

BOLL WEEVIL (Anthonmus grandis) - Results of survey in CALIFORNIA and NEW MEXICO negative. (PPC West. Reg., Aug. Rpt.).

CARIBBEAN FRUIT FLY (*Anastrepha suspensa*) - FLORIDA - Cattley guavas at Auburndale, Polk County, believed infested since August 1; summer crop approximately 75 percent infested. (Simanton, Suit, Aug. 25). Few adult flies trapped in Miami area, Dade County, and at Venice, Sarasota County. (Fla. Coop. Sur., Sept. 13).

CITRUS BLACKFLY (*Aleurocanthus woglumi*) - TEXAS - Surveys in Hidalgo and Zavala Counties negative. (PPC South. Reg., Aug. Rpt.). MEXICO - Chemical Control Zone - Inspection of 58,305 trees on 113 properties in States of Nuevo Leon, Tamaulipas and Sonora revealed 2 infestations in Municipio Hualahuises, Nuevo Leon. In Municipio Hualahuises, 4,255 trees sprayed; first application on 560 trees, second on 1,724, third on 1,971 trees. Spraying completed at Matamoros, Tamaulipas, with 11 trees on 10 properties receiving second and third applications and 226 trees on 98 properties receiving third treatment. Biological Control Zone - Inspection of 34,988 trees on 45 properties in 5 municipios in southern Tamaulipas revealed infestations on 941 trees on 32 properties in municipios Mainero, Villagran, Hidalgo, Guemez, and Padilla. Treatments applied to 2,229 trees in Municipio Mainero; initial application on 1,147 trees on 5 properties, 782 trees on 3 properties received second application and 1,082 trees on 5 properties sprayed for third time. (PPC. Mex. Reg., Aug. Rpt.).

MEDITERRANEAN FRUIT FLY (*Ceratitis capitata*) - TEXAS - Last bait spray application completed September 22 in Brownsville area. First adult trapped June 13, last fly caught July 27. Eradication effort required 17 treatments made at 5 to 7-day intervals. Actual acreage treated averaged 13,000 each application; aggregate of approximately 220,000 acres treated. Area to be retained under quarantine until inspection negative for 3 generations. This will be about mid-November. Until that time certification of fruit will be made by fumigation in infested area, or by continued absence of flies in noninfested area of Cameron County. (PPC). MEXICO - Inspection of 1,298 traps located from Matamoros to Nuevo Laredo, Tamaulipas, negative. Inspection of host fruits negative. (PPC Mex. Reg., Aug. Rpt.).

A SLUG (*Arion ater*) - CALIFORNIA - Light in nursery at Perkins, Sacramento County. Controls applied in effort to eradicate pest as this only known occurrence in Sacramento County. (Cal. Coop. Rpt.).

INSECT DETECTION

New United States Record

A CRANE FLY (Tipula paludosa) - WASHINGTON - Single male taken in light trap operated by Plant Quarantine Division at Blaine, Whatcom County, September 14, 1966. Det. by S. Nakahara, confirmed by A. Stone. This first record of this pest of grasses in the United States. (Telford). Nearest known infestation at Vancouver, British Columbia, Canada, approximately 27 miles distant. (PPC). Additional male taken in same light trap at Blaine September 23. (PQ). For background information on this insect see page 949.

New State Record

BERMUDAGRASS MITE (Aceria neocynodonis) - HAWAII - Heavy on bermudagrass in Lihue, Kauai, and on University of Hawaii campus in Honolulu, Oahu. (p. 948).

New County Records

SPOTTED ALFALFA APHID (Therioaphis maculata) - SOUTH DAKOTA - Alates collected in Sully, Dewey, Corson and Codington Counties. (p. 935).

SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) - MISSOURI - Collected in Bollinger County September 16. (p. 935).

WHITE-FRINGED BEETLES (Graphognathus spp.) - ARKANSAS - Collected in Monroe County. (p. 944).

RANGE CATERPILLAR (Hemileuca oliviae) - NEW MEXICO - Larvae collected September 12 in Lincoln County. This farthest southern record in State. (p. 944).

CORRECTIONS

CEIR 16(36):894 - Under Aleurocanthus woglumi probable origin should read Cuba for Florida and Mexico for Texas. As citrus blackfly has been eradicated from Texas, add footnote 2.

CEIR 16(36):896 - Under Rhipicephalus evertsi, add footnote 2.

HAWAII INSECT REPORT

New State of Hawaii Record - All stages of BERMUDAGRASS MITE (Aceria neocynodonis) heavy on bermudagrass in Lihue, Kauai, and on University of Hawaii campus in Honolulu, Oahu. Det. by F. Haramoto. (Lyman et al.).

Insects of Regional Significance - Nymphs and adults of a PLATASPID BUG (Coptosoma xanthogramma) present in large numbers on an African tuliptree (Spathodea companulata) in Kailua, Oahu. This first occurrence on plant in bignonia family. (Mitchell). MELON FLY (Dacus cucurbitae) larvae medium to heavy on immature tomatoes and cantaloups in unsprayed home gardens in Hilo, Hawaii Island. Cantaloups nearly 100 percent infested. Eggs and adults detected on injured fruits. (Yoshioka).

Pastures - A GRASSHOPPER (Trimerotropis pallidipennis) present on bermudagrass and weeds along road shoulders and irrigation ditches in scattered areas; considered light. Infested area approximately 1,280 acres. (Au et al.). A BILLBUG (Sphenophorus venatus vestitus) - All stages increased from light to light-medium in Kikuyu grass pasture at Kahua Ranch, North Kohala, Hawaii Island. Infesting approximately 3,000 acres at 2,200-3,500 feet elevation. (Yamayoshi, Oshiro).

General Vegetables - TOBACCO FLEA BEETLE (Epitrix hirtipennis) adults light to medium on foliage of eggplant, tomato, and poha plants (Physalis peruviana) in Lawai, Kalaheo and Kaumakani, Kauai. Substantial damage to small seedlings noted. (Au, Ikehara).

Ornamentals - All stages of NEW GUINEA SUGARCANE WEEVIL (Rhabdoscelus obscurus) severely damaged bird-of-paradise plants (Strelitzia sp.) in Lihue, Kauai. (Au, Ikehara).

Beneficial Insects - A WEEVIL (Apion antiquum) heavy on potted emex plants (Emex spinosa, a noxious weed) in insectary at Hilo, Hawaii Island. This leaf and stem feeder introduced in 1957 to aid control of emex. (Yoshioka). A CHRYSOMELID BEETLE (Octotoma scabripennis) - Light adult feeding noted on mint plant (Mentha sp.) growing adjacent to lantana in Kealakekua, Hawaii Island. (Harley).

EUROPEAN CRANE FLY (Tipula paludosa Meigen)

Economic Importance - This tipulid, considered the most damaging of the crane flies of northern Europe, is a serious pest of grains and sod grasses. It also attacks many other crops. Larvae feed on roots and other tender plant parts. Heavy infestations may develop. An estimated 2.75 million larvae per acre have been found in lowland pastures in Scotland. An average of 24.8 larvae per square foot was found locally on lawn in Newfoundland. Infested grass areas become thin and yellowish. The stand in germinating grain fields may be severely affected. In Canada, where the European crane fly was identified for the first time in 1955, the species attacks lawns, grasses, and crucifers. Severe damage to lawns in North Surrey (a suburb of Vancouver), British Columbia, has been reported.

Distribution - Canada: Newfoundland, Nova Scotia, British Columbia. Denmark, France, Germany, Great Britain, Norway, Poland, Spain, Sweden, Switzerland, USSR (European).

United States: Washington (A single male taken in light trap at Blaine on September 14, 1966, additional male collected on September 23, 1966).

Hosts - Barley, oats, wheat, rye and other grasses; turnip, strawberry, peas, corn, tobacco.

Biology and Habits - Adults, which appear from the latter part of June through September, usually fly during the evening, but may be active also in the morning. Copulation occurs shortly after emergence and lasts for an hour or more. Females oviposit very soon after mating. The eggs are usually pushed into the soil; however, females have been observed ejecting eggs while suspended from plants. Egg laying may take place at several sites. Each female may deposit 250-500 eggs. Incubation takes two weeks. Young larvae normally feed on decomposed vegetable debris but readily turn to living plants when the soil is low in organic content. The length of larval stage may vary but usually lasts about 9 months. Overwintering takes place in or on the soil surface in which the larva makes irregular galleries. The larva is resistant to cold and becomes active when the temperature rises, but is extremely susceptible to drought and high temperatures. The older larvae migrate at night and feed heavily on host plants. Pupation takes place near the end of May and emergence occurs in about 3 weeks. In France, there is only one generation a year.

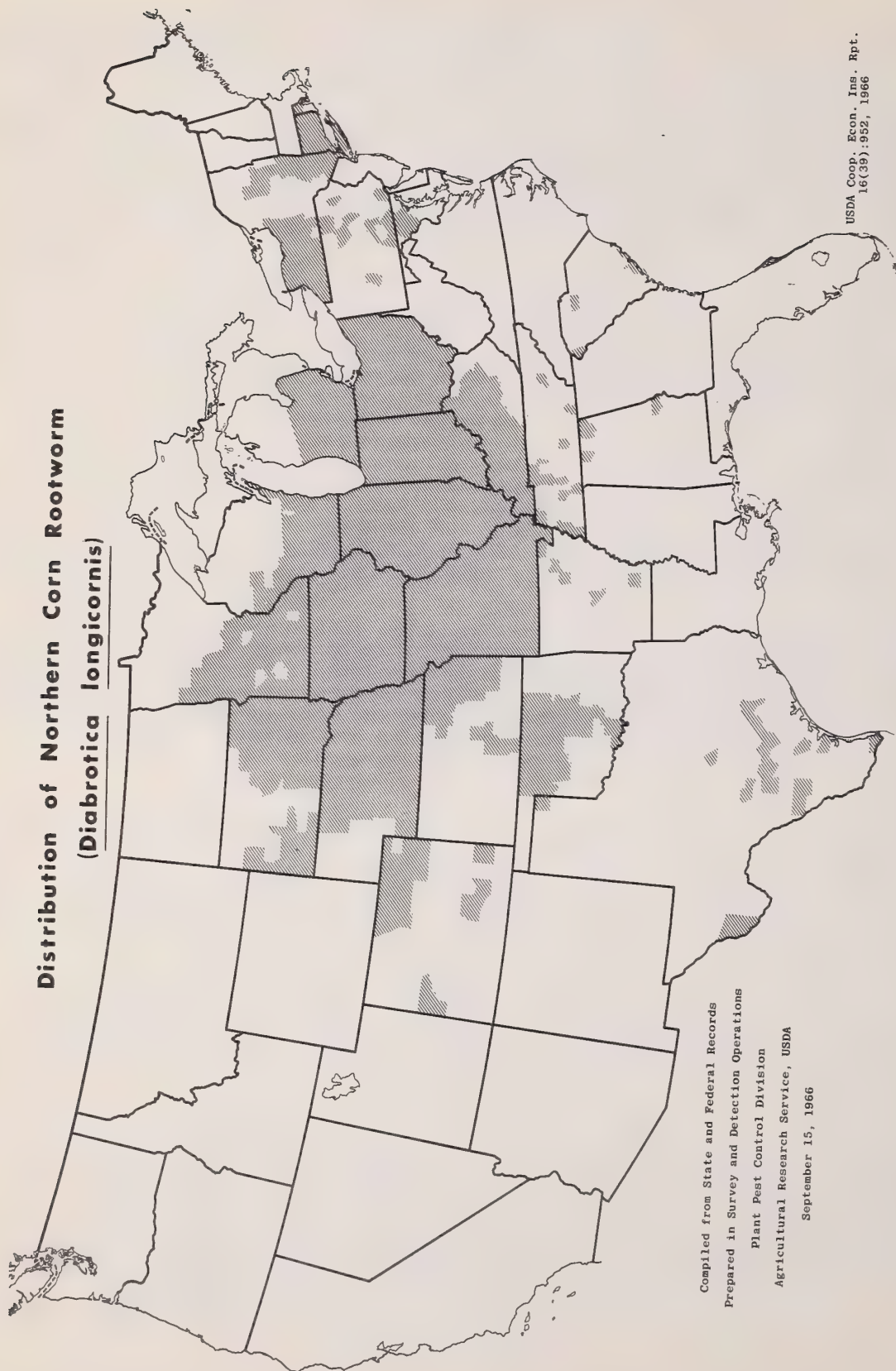
Description - Adult - Clear brownish. Head elongated in form of a snout, antenna brown, with 14-15 segments, the first two yellow. In some females the third and fourth segments also may be yellow. Sides of thorax, scutellum and postscutellum covered with a grayish frosting. Wings straight, elongated and have a milky tinge, brownish along length of anterior margin. Female with abdomen longer than wings. The species is difficult to distinguish from other tipulids, particularly females. Males may be identified by genitalia. Length of male 16-18 mm., female 19-25 mm.

Larva - Young larva pinkish white and thin with a rather large head. Length about 3 mm. Older larva cylindrical, grayish, with a black head, and two strong mandibles. Legless, posterior part of abdomen with 6 membranous protuberances between which are two large black and rounded breathing pores. Length 35-40 mm.

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 4. Rennie, J. 1916 and 1917. Ann. Appl. Biol. 2(4):235-240; 3(2/3):116-137.
- For data on T. oleracea L. see USDA Coop. Econ. Ins. Rpt. 8(9):161-162, 1958.

Distribution of Northern Corn Rootworm
(*Diabrotica longicornis*)



Compiled from State and Federal Records
Prepared in Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service, USDA
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USDA Coop. Econ. Ins. Rpt.
16(39):952, 1966

Surveys for Heliothis Moths in Arkansas^{1/}

W. P. Boyer, Charles Lincoln and J. R. Phillips

The use of sugar baits has been developed as a survey method to determine field populations of Heliothis moths in Arkansas. Light traps placed in forestry towers are being used to study possible migration of moths.

Sugar baits were used by Burdette (1932) and by Ditman and Cory (1933) to test the response of moths to sugar solutions. Ditman and Cory (1936) tested several insecticides as a control measure for moths. In early work some 30 years ago many moths were killed, but effective control was not obtained.

In Arkansas the possibilities of sugar baits for survey and control purposes are being reexamined. The survey aspect only is covered in this report.

Limited work in 1961 and 1962 showed that moths would respond to a sweet spray on cotton plants. In 1963 methods were developed and standardized. Survey by this method was expanded in 1964 and again in 1965. Crops sprayed have been cotton, corn, soybeans and combine-type grain sorghum.

Sugar spray is applied to each 50th row in a field. Row length determines the number of rows selected. Total row length sprayed generally amounts to one-half to one mile.

The sugar spray is applied around 6:00 p.m. using a compressed air sprayer at walking speed with one nozzle held six inches to one foot above the plants. Pressure is kept relatively low to give large droplets; however, droplets can be too large resulting in the spray running off the plants. After comparing sugar concentrations of 0.75, 1.5 and 3 pounds per gallon, 1.5 pounds per gallon was chosen as a standard.

Baited rows or "sugar lines" are checked soon after dark at slow walking speed, using a headlight.

An increase in the number of moths observed daily, Monday through Friday, has been rather significant. It is not known whether this may be due to sugar accumulation or possible "training" of the moths.

Numbers of Heliothis moths on sugar lines in the Jefferson Community, Desha County, were compared with numbers taken in a standard blacklight trap in the same area for 1964-65. See table on following page. Moths on sugar lines are expressed as numbers per 1,000 row feet while actual numbers taken in the trap are listed. Data show that the light trap is rather inefficient in estimating field populations of moths during June, July and part of August. During mid-to late August, relatively more moths were taken in the light trap than were observed on sugar lines. This is thought to be due to crops approaching maturity and becoming unattractive. Sugar line data along with light trap data provide a clearer picture of the seasonal occurrence of H. virescens moths.

During May 31 through July 2 from 3.3 to 24.3 percent Heliothis moths in the field were H. virescens. In the light trap H. zea moths were low during this period but no H. virescens were taken. After mid-August H. virescens were taken in the light trap while none were observed on sugar lines. Sugar line data show that peak moth populations in the field occurred at approximately five-week intervals in 1965.

Many workers over a long period of time have reported a 30-day life cycle in laboratory rearing at summer temperatures. The five-week peak has helped explain a puzzling problem in that outbreaks of bollworm have occurred in soybeans in late August approximately five weeks after July outbreaks in cotton.

^{1/} Published with the approval of the Director, Agricultural Experiment Station.

Moth peaks did not show up in light traps as distinctly as they did on sugar lines in 1965. Unpublished results of a previous study showed that peak moth numbers in light traps may appear about one week later than peaks of eggs on cotton. This would indicate that moths taken in light traps are older spent moths. It is known that moths of all ages are observed on sugar baits.

Factors other than populations have been studied in connection with this survey. Although the full significance of shades of color of the bollworm moth is not known, it has been determined that moths from pupae which were in diapause are light in color. To further study the color factor, moths are classed as light or dark and the data recorded seasonally and by host. Moths are collected and examined to determine the number of times females have mated. These data are recorded seasonally and by host. A study is also being made of the possible differences between hosts regarding the time of peak numbers and total numbers of moths during the season.

This method of survey apparently could be used for other species of insects. Data on other species were not collected; however, it was quite evident that moths of cabbage looper (Trichoplusia ni), armyworm (Pseudaletia unipuncta) and green cloverworm (Plathypena scabra) respond to the sugar spray.

Table. Heliothis moths on sugar lines and in light trap. Desha County, Arkansas. 1964 - 65.

1964			1965		
Date	1000 Row Ft.	Light Trap	Date	1000 Row Ft.	Light Trap
6/1-5	8.2	2	5/31-6/3	29.83	5
6/8-12	34.9	0	6/7-10	9.70	1
6/15-19	14.7	2	6/14-18	15.07	7
6/22-25	7.0	0	6/21-25	5.17	1
6/30-7/3	5.8	1	6/28-7/2	11.76	0
7/6-10	22.3	5	7/7-9	41.27	4
7/13-17	48.9	26	7/12-16	23.20	11
7/20-24	6.5	13	7/19-23	2.17	14
7/27-31	2.2	4	7/26-30	0.81	9
8/3-7	1.7	41	8/2-5	1.53	12
8/10-14	6.3	242	8/9-13	29.96	4
8/15-19	X	85	8/16-18	12.22	8
8/20-24	X	XX	8/24-27	6.24	148
8/25-9/1	X	71	8/30-9/2	13.98	105
X Sugar lines not run					
XX Light trap out of order					

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